REMARKS

Claims 1-14 and 23-26 are pending in this application. Claims 1, 7, 8, 13, 14, 23, and 25 are amended herein. Support for the amendments to the claims may be found in the claims as originally filed. Reconsideration is requested based on the foregoing amendment and the following remarks.

Objections to the Claims:

Claims 7, 8, 13, 14, and 23 were objected to for various informalities. Claims 7, 8, 13, 14, and 23 were amended in substantial accord with the Examiner's suggestions. The Examiner's suggestions are appreciated. Withdrawal of the objection is earnestly solicited.

Objections to the Drawings:

Fig. 2 was objected to as contradicting the disclosure and being non-functional. The rejection is traversed.

As noted in section 5, at the top of page 3 of the Office Action, two contacts are provided directly to the organo-resistive material 9, and no contacts are provided to the electrolyte 10. This is described in the specification as filed originally at, for example, page 4, lines 14-18 and page 5, lines 8-11. There, as described with respect to Fig. 1, an electrical voltage between the organo-resistive material 2 and the conductive layer 3 initiates an ionic current through an electrolyte 4. As may be seen in Fig. 1, no contact is provided to the electrolyte 4.

Similarly, as shown in Fig. 2, if the voltage 12 applied to the organo-resistive conductive element 9 were different then the supply voltage 5, the voltage difference between the organo-resistive conductive element 9 and the control element 11 would cause an ionic current to flow in electrolyte 10 as well. There is no necessity for a direct contact to the electrolyte 10, since the voltage differential between the organo-resistive conductive element 9 and the control element 11 causes the ionic current to flow in the electrolyte 10. Consequently, as may be seen in Fig. 2, no contact is provided to the electrolyte 10, either, in a manner similar to that of Fig. 1. This is described, for example, in the specification as filed originally at page 5, lines 18-28. Fig. 2 is thus submitted to be consistent with the specification, and functional.

Withdrawal of the objections to the drawings is earnestly solicited.

Claim Rejections - 35 U.S.C. § 112:

Claim 7 was rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement.

The third clause of claim 7 has been amended to replace the recitation "ohmically coupling the first circuit to at least one resistor, to an organo-resistive conductive element embedded in the electrolyte, and to a control electrode" with the recitation "ohmically coupling the first circuit to the memory unit." Claim 7 is submitted to comply with the written description requirement within the meaning of 35 U.S.C. § 112, first paragraph. Withdrawal of the rejection of claim 7 is earnestly solicited.

Enablement:

Claim 7 was rejected under rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which is not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The rejection is traversed.

Ohms law describes resistance. Electrically direct connected parts are "ohmically coupled," whether resistance is linear or not. No representation is made that referring to an electrical connection as "ohmically coupled" implies adherence to Ohms law, contrary to the implication in the Office Action.

The Office Action asserts in section 8, at page 5, that:

> As such, there cannot be an only contact between a ground potential and a supply voltage since the presence of the organo-resistive material/electrolyte structure in the first circuit prevents the first circuit from behaving ohmically.

Claim 7, however, recites "ohmically coupling the first circuit between and to a ground potential and a supply voltage," not coupling a ground potential and a supply voltage to each other through the first circuit. Consequently, whether the first circuit behaves ohmically are not is unrelated to whether the first circuit can be ohmically coupled to a ground potential, or to a supply voltage. As discussed above, electrically directly connected parts are "ohmically coupled." Consequently, claim 7 is submitted to be enabled within the meaning of 35 U.S.C. § 112, first paragraph. Withdrawal of the rejection of claim 7 is earnestly solicited.

Claims 23 and 25:

Claims 23 and 25 were rejected under rejected under 35 U.S.C. § 112, first paragraph, as

containing subject matter which is not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The rejection is traversed.

The Office Action asserts in section 9, at page 6, that:

> In fact, the specification teaches that the electrolyte is not ohmically coupled to the organo-resistive material since this device does not follow ohms law (V=IR).

To the contrary, as discussed above, the term "ohmically coupled" means connected electrically directly. Whether or not the organo-resistive material follows Ohms law or not is not relevant to whether the organo-resistive material is ohmically coupled to the electrolyte or not. Consequently, claims 23 and 25 are submitted to be enabled within the meaning of 35 U.S.C. § 112, first paragraph. Withdrawal of the rejection of claim 7 is earnestly solicited.

Second Paragraph:

Claim 7 was rejected under 35 U.S.C. § 112, second paragraph, as indefinite. Claim 7 was amended to make it more definite. In particular, as discussed above, third clause of claim 7 has been amended to replace the recitation "ohmically coupling the first circuit to at least one resistor, to an organo-resistive conductive element embedded in the electrolyte, and to a control electrode" with the recitation "ohmically coupling the first circuit to the memory unit."

Moreover, as also discussed above, whether the first circuit behaves ohmically are not is unrelated to whether the first circuit can be ohmically coupled to a ground potential, or to a supply voltage. As discussed above, electrically directly connected parts are "ohmically coupled." Claim 7 is submitted to be definite within the meaning of 35 U.S.C. § 112, second paragraph. Withdrawal of the rejection of claim 7 is earnestly solicited.

Claims 23 and 25:

Claims 23 and 25 were rejected under 35 U.S.C. § 112, second paragraph, as indefinite. The rejection is traversed.

As discussed above, the term "ohmically coupled" means connected electrically directly. Whether or not the organo-resistive material follows Ohms law or not is not relevant to whether the organo-resistive material is ohmically coupled to the electrolyte or not, as also discussed above. Claims 23 and 25 are submitted to be definite within the meaning of 35 U.S.C. § 112, second paragraph. Withdrawal of the rejection of claims 23 and 25 is earnestly solicited.

Claim Rejections - 35 U.S.C. § 102:

Claims 1-4, 6, 7, 9, 12, 13, 25, and 26 were rejected under 35 U.S.C. § 102(b) as anticipated by Roth, "Characterization of Charge Storage in Redox-Active Self Assembled Monolayers," Langmuir 2002, 18, 4030-4040 ((hereinafter "Roth-Langmuir"). The rejection is traversed. Reconsideration is earnestly solicited.

Claim 1 recites:

An organo-resistive material embedded in the electrolyte to form the memory unit.

Roth-Langmuir neither teaches, discloses, nor suggests "an organo-resistive material embedded in the electrolyte to form the memory unit," as recited in claim 1. Roth-Langmuir, rather, describes a self-assembled *monolayer* formed on the surface of an *electrode*, which is then exposed to an electrolyte solution, not "an organo-resistive material embedded in the electrolyte," contrary to the assertion in the Office Action. In particular, as described at page 4032, in the left column, lines 3-7:

> The SAMs were formed by placing the electrode in a 2 mg/mL solution of $C_{12}Fc$, PM1, or PM3 for 20 min and sonicating for an additional 1 min.

Roth-Langmuir, moreover, exposes the *electrode* to the electrolyte solution, not an organo-resistive material. In particular, as also described at page 4032, in the left column, lines 32-35:

> PDMS adheres well to glass surfaces and prevents leakage of solution, thereby defining the area of electrode that will be exposed to electrolyte solution.

Since Roth-Langmuir places an electrode in a solution including an organo-resistive material to form a self-assembled *monolayer* on the surface of the electrode, and then exposes the *electrode* to an electrolyte solution, Roth-Langmuir has no "organo-resistive material embedded in the electrolyte to form the memory unit," as recited in claim 1. Claim 1 is submitted to be allowable. Withdrawal of the rejection of claim 1 is earnestly solicited.

Claims 2-4, 6, 7, 9, 12, and 13 depend from claim 1 and add further distinguishing elements. Claims 2-4, 6, 7, 9, 12, and 13 are thus also submitted to be allowable. Withdrawal of the rejection of claims 2-4, 6, 7, 9, 12, and 13 is also earnestly solicited.

Claims 25 and 26:

The third clause of claim 25 recites:

An organo-resistive material ohmically coupled to the electrolyte to form the

memory unit.

Roth-Langmuir neither teaches, discloses, nor suggests "an organo-resistive material ohmically coupled to the electrolyte to form the memory unit," as discussed above with respect to the rejection of claim 1. Claim 25 is the submitted to be allowable, for at least those reasons discussed above with respect to the rejection of claim 1. Withdrawal of the rejection of claim 25 is earnestly solicited.

Claim 26 depends from claim 25 and adds further distinguishing elements. Claim 26 is thus also submitted to be allowable. Withdrawal of the rejection of claim 26 is earnestly solicited.

Roth-J. Vac.:

Claims 1-4, 6, 7, 9, 12, 13, 25, and 26 were rejected under 35 U.S.C. § 102(b) as anticipated by Roth et al. "Molecular Approach toward Information Storage Based on the Redox Properties of Porphyrins in Self-Assembled Monolayers," J. Vac. Sci. Technol. Pp2359-2364 (hereinafter "Roth-J. Vac."). The rejection is traversed. Reconsideration is earnestly solicited.

Roth-J. Vac. neither teaches, discloses, nor suggests "an organo-resistive material embedded in the electrolyte to form the memory unit," as recited in claim 1. Roth-J. Vac, rather, immerses the microelectrode in the electrolyte to *form* the self-assembled monolayers. In particular, as described at page 2360, in the left column, in lines 7-11 of Section II, "Experiment":

> The self-assembled monolayers (SAMs) of the porphyrins were formed by immersing the microelectrode in a 2 mg/milliliter solution of porphyrins for 20 min and sonic hating for an additional 1 min.

Since Roth-J. Vac. immerses the microelectrode in the electrolyte to form the self-assembled polymers, Roth-J. Vac. shows no "organo-resistive material embedded in the electrolyte to form the memory unit," as recited in claim 1.

Roth-J. Vac., in fact, *removes* the microelectrode from the electrolyte. In particular, In particular, as described at page 2360, in the left column, in lines 11 and 12 of Section II, "Experiment":

> The microelectrode was removed and rinsed with distilled CH_2CL_2.

Since Roth-J. Vac. removes the microelectrode from the electrolyte, Roth-J. Vac. shows no "organo-resistive material embedded in the electrolyte to form the memory unit," as recited in claim 1.

Roth-J. Vac., finally, leaves only a thin *film* of electrolyte on the electrode. In particular, as described in the right column at page 2360, in the label of Fig. 2:

> Cyclic staircase voltammetry (100 V s^{-1}) of the PM0 SAM on a 25 μm diam Au electrode in a film of an electrolyte solution containing 0.10 M Bu_4NPF_6 in dried, distilled CH_2CL_2 using a Ag wire counter electrode.

Since Roth-J. Vac. leaves only a thin film of electrolyte on the electrode, Roth-J. Vac. shows no "organo-resistive material embedded in the electrolyte to form the memory unit," as recited in claim 1. Claim 1 is submitted to be allowable. Withdrawal of the rejection of claim 1 is earnestly solicited.

Claims 2-4, 6, 7, 9, 12, and 13 depend from claim 1 and add further distinguishing elements. Claims 2-4, 6, 7, 9, 12, and 13 are thus also submitted to be allowable. Withdrawal of the rejection of claims 2-4, 6, 7, 9, 12, and 13 is also earnestly solicited.

Claims 25 and 26:

Roth-J. Vac. neither teaches, discloses, nor suggests "an organo-resistive material ohmically coupled to the electrolyte to form the memory unit," as discussed above with respect to the rejection of claim 1. Claim 25 is the submitted to be allowable, for at least those reasons discussed above with respect to the rejection of claim 1. Withdrawal of the rejection of claim 25 is earnestly solicited.

Claim 26 depends from claim 25 and adds further distinguishing elements. Claim 26 is thus also submitted to be allowable. Withdrawal of the rejection of claim 26 is earnestly solicited.

US Patent No. 6,447,879 to Sakurai et al.

Claims 1-6, 9-14 and 25-26 were rejected under 35 U.S.C. § 102(e) as anticipated by US Patent No. 6,447,879 to Sakurai et al. (hereinafter "Sakurai "). The rejection is traversed. Reconsideration is earnestly solicited.

Sakurai neither teaches, discloses, nor suggests "an organo-resistive material embedded in the electrolyte to form the memory unit," as recited in claim 1. Sakurai, in fact, mentions no organo-resistive material at all, let alone a memory unit, contrary to the assertions in the Office Action. Sakurai, rather, describes an organic solar cell, as described at column 17, lines 38-43:

> As shown in FIG. 5, this organic solar cell has a stacked structure including a Nesa glass substrate 1, a p-type polypyrrole film 2, an Mg phthalocyanine coating layer (not shown), and an aluminum electrode 4 formed on the Mg phthalocyanine coating layer via an aqueous electrolyte solution layer 3

containing phosphate hexafluoride.

Since Sakurai describes an organic solar cell, Sakurai has no use for "an organo-resistive material embedded in the electrolyte to form the memory unit," as recited in claim 1.

In Sakurai, moreover, an aluminum electrode 4 is *formed* on the Mg phthalocyanine coating layer via an aqueous electrolyte solution, instead of an "organo-resistive material embedded in the electrolyte to form the memory unit," as recited in claim 1.

Dendritic structure 13, moreover, is a dendritic structure, not an organo-resistive material, contrary to the assertion in the Office Action. In particular, as described at column 17, lines 43-47:

> The surface of the p-type polypyrrole film 2 on the side of the aqueous electrolyte solution layer has dendritic structures 13 of a few μm high.

Since dendritic structure 13 is a dendritic structure, Sakurai describes no "organo-resistive material embedded in the electrolyte to form the memory unit," as recited in claim 1.

Pyramidal projections 14, moreover, are pyramidal projections, not an organo-resistive material, contrary to the assertion in the Office Action. In particular, as described at column 18, lines 45-49:

> The surface of the p-type polypyrrole film 2 on the side of the aqueous electrolyte solution layer has a plurality of pyramidal projections 14 of 10 μm high having myriad micropores.

Since pyramidal projections 14 are pyramidal projections, Sakurai describes no "organo-resistive material embedded in the electrolyte to form the memory unit," as recited in claim 1. Claim 1 is submitted to be allowable. Withdrawal of the rejection of claim 1 is earnestly solicited.

Claims 2-6 and 9-14 depend from claim 1 and add further distinguishing elements. Claims 2-6 and 9-14 are thus also submitted to be allowable. Withdrawal of the rejection of claims 2-6 and 9-14 is also earnestly solicited.

Claims 25 and 26:

Sakurai neither teaches, discloses, nor suggests "an organo-resistive material ohmically coupled to the electrolyte to form the memory unit," as discussed above with respect to the rejection of claim 1. Claim 25 is the submitted to be allowable, for at least those reasons discussed above with respect to the rejection of claim 1. Withdrawal of the rejection of claim 25 is earnestly solicited.

Claim 26 depends from claim 25 and adds further distinguishing elements. Claim 26 is thus also submitted to be allowable. Withdrawal of the rejection of claim 26 is earnestly solicited.

US Patent No. 6,958,270 to Misra et al.

Claims 1-14 and 23-26 were rejected under 35 U.S.C. § 102(e) as anticipated by US Patent No. 6,958,270 to Misra et al. (hereinafter "Misra "). The rejection is traversed. Reconsideration is earnestly solicited.

Misra neither teaches, discloses, nor suggests "an organo-resistive material embedded in the electrolyte to form the memory unit," as recited in claim 1. Misra, in fact, mentions no memory unit at all. Misra, rather, is fabricating crossbar array microelectronic electrochemical cells, and so has no use for "an organo-resistive material embedded in the electrolyte to form the memory unit," as recited in claim 1.

Misra, moreover, mentions no organo-resistive material at all, contrary to the assertion in the Office Action. Misra, rather, describes polyaniline as intrinsically *conducting*, not resistive, let alone organo-resistive. In particular, as described at column 4, lines 36, 37, and 38:

> Conductive polymers are well known to those of skill in the art, for example, a commercially available intrinsically conducting polymer is Polyaniline (PAni) (ORMECON™).

Since Misra describes polyaniline as intrinsically conducting, Misra has no "organo-resistive material embedded in the electrolyte to form the memory unit," as recited in claim 1. Claim 1 is submitted to be allowable. Withdrawal of the rejection of claim 1 is earnestly solicited.

Claims 2-14 depend from claim 1 and add further distinguishing elements. Claims 2-14 are thus also submitted to be allowable. Withdrawal of the rejection of claims 2-14 is also earnestly solicited.

Claims 23 and 24:

The fourth clause of claim 23 recites:

> An organo-resistive material ohmically coupled to the electrolyte to form the memory unit.

Misra neither teaches, discloses, nor suggests "an organo-resistive material ohmically coupled to the electrolyte to form the memory unit," as discussed above with respect to the rejection of claim 1. Claim 23 is the submitted to be allowable, for at least those reasons discussed above with respect to the rejection of claim 1. Withdrawal of the rejection of claim 23

is earnestly solicited.

Claim 24 depends from claim 23 and adds further distinguishing elements. Claim 24 is thus also submitted to be allowable. Withdrawal of the rejection of claim 24 is earnestly solicited.

Claims 25 and 26:

Misra neither teaches, discloses, nor suggests "an organo-resistive material ohmically coupled to the electrolyte to form the memory unit," as discussed above with respect to the rejection of claim 1. Claim 25 is the submitted to be allowable, for at least those reasons discussed above with respect to the rejection of claim 1. Withdrawal of the rejection of claim 25 is earnestly solicited.

Claim 26 depends from claim 25 and adds further distinguishing elements. Claim 26 is thus also submitted to be allowable. Withdrawal of the rejection of claim 26 is earnestly solicited.

Claim Rejections - 35 U.S.C. § 103:

Claims 5, 10, 11, 14, 23, and 24 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Roth-J. Vac. The rejection is traversed to the extent it would apply to the claims as amended. Reconsideration is earnestly solicited.

Claims 5, 10, 11, and 14 depend from claim 1 and add further distinguishing elements. Roth-J. Vac. neither teaches, discloses, nor suggests "an organo-resistive material embedded in the electrolyte to form the memory unit," as discussed above with respect to the rejection of claim 1. Thus, even if Roth-J. Vac were modified as proposed in the Office Action, none of claims 5, 10, 11, or 14 would result. Claims 5, 10, 11, and 14 are thus submitted to be allowable. Withdrawal of the rejection of claims 5, 10, 11, and 14 is earnestly solicited.

Claims 23 and 24:

Roth-J. Vac. neither teaches, discloses, nor suggests "an organo-resistive material ohmically coupled to the electrolyte to form the memory unit," as discussed above with respect to the rejection of claim 1. Thus, even if Roth-J. Vac. Were modified as proposed in the Office Action, claim 23 would not result. Claim 23 is the submitted to be allowable, for at least those reasons discussed above with respect to the rejection of claim 1. Withdrawal of the rejection of claim 23 is earnestly solicited.

Claim 24 depends from claim 23 and adds further distinguishing elements. Claim 24 is thus also submitted to be allowable. Withdrawal of the rejection of claim 24 is earnestly solicited.

Claims 7 and 8:

Claims 7 and 8 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Roth-J. Vac in view of US Patent No. 6,908,536 to Beckmann (hereinafter "Beckmann"). The rejection is traversed to the extent it would apply to the claims as amended. Reconsideration is earnestly solicited.

Claims 7 and 8 depend from claim 1 and add further distinguishing elements. Roth-J. Vac. neither teaches, discloses, nor suggests "an organo-resistive material embedded in the electrolyte to form the memory unit," as discussed above with respect to the rejection of claim 1. Beckman does not either. Beckman, in fact, mentions no organo-resistive material at all. Thus, even if Roth-J. Vac and Beckmann were combined as proposed in the Office Action, neither of claims 7 or 8 would result. Claims 7 and 8 are thus submitted to be allowable. Withdrawal of the rejection of claims 7 and 8 is earnestly solicited.

Conclusion:

Accordingly, in view of the reasons given above, it is submitted that all of claims 1-14 and 23-26 are allowable over the cited references. Allowance of all claims 1-14 and 23-26 and of this entire application is therefore respectfully requested.

Finally, if there are any formal matters remaining after this response, the Examiner is invited to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge them to our Deposit Account No. 19-3935.

Respectfully submitted,

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